

What is claimed is:

- 1 1. A method comprising:
 - 2 establishing a virtual platform for providing services to applications executing under
 - 3 the operating system environment controlled by a single kernel instance;
 - 4 establishing a first non-global zone for maintaining a first application environment
 - 5 and a second non-global zone for maintaining a second application
 - 6 environment; and
 - 7 isolating applications executing in association with the first application environment
 - 8 from applications executing in association with the second application
 - 9 environment;
 - 10 wherein the virtual platform exists for a time period before or after the first
 - 11 application environment and the second application environment.

- 1 2. The method of claim 1, wherein isolating applications executing in association with
 - 2 the first application environment from applications executing in association with the
 - 3 second application environment comprises:
 - 4 starting a first process in association with the first application environment;
 - 5 starting a second process in association with the second application environment; and
 - 6 isolating the first process from the second process; and
 - 7 wherein the virtual platform provides virtualized access to computational resources to
 - 8 the first process and the second process.

- 1 3. The method of claim 1, wherein computational resources comprise at least one of a
2 network interface, a communications interface, a file system, a system console, a
3 DASD address and an operating system service process.
- 1 4. The method of claim 1, wherein isolating applications executing in association with
2 the first application environment from applications executing in association with the
3 second application environment, further comprises:
4 permitting the a process in the first non-global zone to access computational objects
5 within the first non-global zone and to view computational objects within the
6 first non-global zone; and
7 selectively permitting a process existing outside of the first non-global zone and the
8 second non-global zone to view computational objects within the first non-
9 global zone and the second non-global zone.
- 1 5. The method of claim 1, wherein establishing a virtual platform further comprises:
2 creating a zone configuration, thereby enabling transition from a first state to a
3 Configured state;
4 installing the zone configuration, thereby enabling transition from the Configured
5 state to an Installed state; and
6 instantiating processes for providing services, thereby enabling transition from the
7 Installed state to a Ready state.
- 1 6. The method of claim 5, wherein instantiating processes for providing services further
2 comprises at least one of:

3 starting a scheduler process, establishing network interfaces, mounting file systems,
4 initializing a system console and configuring devices.

1 7. The method of claim 1, wherein establishing a first non-global zone for maintaining a
2 first application environment further comprises:
3 starting a process for initializing user processes, thereby enabling transition from the
4 Ready state to a Running state.

1 8. The method of claim 7, further comprising:
2 receiving a command to reboot a non-global zone;
3 halting user processes associated with the application environment of the non-global
4 zone; and
5 freeing resources allocated to support the non-global zone, thereby enabling transition
6 from the Running state to the Installed state;
7 re-instantiating processes for providing services, thereby enabling transition from the
8 Installed state to a Ready state; and
9 re-starting a process for initializing user processes, thereby enabling transition from
10 the Ready state to a Running state.

1 9. The method of claim 7, further comprising:
2 receiving a command to halt a non-global zone;
3 halting user processes associated with the application environment of the non-global
4 zone; and

5 freeing resources allocated to support the non-global zone, thereby enabling transition
6 from the Running state to the Installed state.

1 10. The method of claim 1, wherein a global zone comprises processes not associated
2 with the first non-global zone or the second non-global zone, the method further
3 comprising:
4 permitting processes associated with global zone to view and access objects in the
5 global zone and view objects in at least one non-global zone;
6 permitting processes associated with a non-global zone to view and access objects
7 only in that non-global zone; and
8 selectively permitting upon authorized request, a process of the global zone to access
9 objects in a non-global zone.

1 11. A computer based method for managing resources in an operating system
2 environment controlled by a single kernel instance, the method comprising the steps
3 of:
4 establishing a virtual platform;
5 partitioning the operating system environment into a global zone and at least one non-
6 global zone, each non-global zone comprising an application environment for
7 isolating applications from applications executing in association with other
8 non-global zones, wherein each non-global zone uses services of the virtual
9 platform to access devices and services;
10 permitting processes associated with global zone to view and access objects in the
11 global zone and view objects in the non-global zones and permitting processes

12 of each non-global zone to view and access objects only in the non-global
13 zone; and
14 selectively permitting upon authorized request, a process of the global zone to access
15 objects in a non-global zone; and
16 wherein the virtual platform exists for a time period before or after the application
17 environment.

1 12. The method of claim 11, further comprising:
2 permitting a first process to access objects within the global zone and a second
3 process to access objects within the global zone and at least one non-global
4 zone;
5 thereby enabling the global zone to provide at least one of a default virtual
6 environment and a system administrative environment.

1 13. A computer readable medium, comprising:
2 instructions for causing one or more processors to establish a virtual platform in an
3 operating system controlled by a single kernel instance, the virtual platform
4 comprising services for supporting non-global zones;
5 instructions for causing one or more processors to establish a first non-global zone for
6 maintaining a first application environment and a second non-global zone for
7 maintaining a second application environment;
8 instructions for causing one or more processors to isolate applications executing in
9 association with the first application environment from applications executing
10 in association with the second application environment; and

11 wherein the virtual platform exists for a time period before or after the first
12 application environment and the second application environment.

1 14. A computer readable medium of claim 13, further comprising:
2 instructions for causing one or more processors to start a first process within the first
3 application environment; and
4 instructions for causing one or more processors to start a second process within the
5 second application environment;
6 instructions for causing one or more processors to isolate the first process from the
7 second process; and
8 wherein the virtual platform provides virtualized access to computational resources to
9 the first process and the second process.

1 15. The computer readable medium of claim 14, wherein computational resources
2 comprise at least one of:
3 a network interface, a communications interface, a file system, a system console, a
4 DASD address and an operating system service process.

1 16. The computer readable medium of claim 14, wherein the instructions for causing one
2 or more processors to isolate the first process from the second process, further
3 comprise:
4 instructions for causing one or more processors to permit the first process to access
5 computational objects within the first non-global zone and to view
6 computational objects within the first non-global zone; and

7 instructions for causing one or more processors to selectively permit a process
8 existing outside of the first non-global zone and the second non-global zone to
9 view computational objects within the first non-global zone and the second
10 non-global zone.

1 17. The computer readable medium of claim 13, wherein the instructions for causing one
2 or more processors to establish a virtual platform further comprise:
3 instructions for causing one or more processors to create a zone configuration,
4 thereby enabling transition from a first state to a Configured state;
5 instructions for causing one or more processors to install the zone configuration,
6 thereby enabling transition from the Configured state to an Installed state; and
7 instructions for causing one or more processors to instantiate processes for providing
8 the plurality of services, thereby enabling transition from the Installed state to
9 a Ready state.

1 18. The computer readable medium of claim 17, wherein the instructions for causing one
2 or more processors to instantiate processes for providing the plurality of services
3 further comprises:
4 instructions for causing one or more processors to process at least one of starting a
5 scheduler process, establishing network interfaces, mounting file systems
6 initializing a system console and configuring devices.

1 19. The computer readable medium of claim 13, wherein the instructions for causing one
2 or more processors to establish a first non-global zone for maintaining a first
3 application environment further comprises:
4 instructions for causing one or more processors to start a process for initializing user
5 processes, thereby enabling transition from the Ready state to a Running state.

1 20. The computer readable medium of claim 19, wherein the instructions for causing one
2 or more processors to process further comprises:
3 instructions for causing one or more processors to receive a command to reboot a
4 non-global zone;
5 instructions for causing one or more processors to halt user processes associated with
6 the non-global zone; and
7 instructions for causing one or more processors to free resources allocated to support
8 the non-global zone, thereby enabling transition from the Running state to the
9 Installed state;
10 instructions for causing one or more processors to re-instantiate processes for
11 providing the services, thereby enabling transition from the Installed state to a
12 Ready state; and
13 instructions for causing one or more processors to re-start a process for initializing
14 user processes, thereby enabling transition from the Ready state to a Running
15 state.

1 21. The computer readable medium of claim 19, wherein the instructions for causing one
2 or more processors to process comprise:

3 instructions for causing one or more processors to receive a command to halt a non-
4 global zone;
5 instructions for causing one or more processors to halt user processes associated with
6 the non-global zone; and
7 instructions for causing one or more processors to free resources allocated to support
8 the non-global zone, thereby enabling transition from the Running state to the
9 Installed state.

1 22. The computer readable medium of claim 13, wherein a global zone comprises
2 processes not associated with the first non-global zone or the second non-global zone,
3 and wherein the instructions for causing one or more processors to process comprise:
4 instructions for causing one or more processors to permit processes associated with
5 global zone to view and access objects in the global zone and view objects in
6 the non-global zone;
7 instructions for causing one or more processors to permit processes associated with
8 non-global zone to view and access objects only in the non-global zone; and
9 instructions for causing one or more processors to selectively permit upon authorized
10 request, a process of the global zone to access objects in the non-global zone.

1 23. A computer readable medium, comprising:
2 instructions for causing one or more processors to establish a virtual platform;
3 instructions for causing one or more processors to partition an operating system
4 environment controlled by a single kernel instance into a global zone and at
5 least one non-global zone, each non-global zone comprising an application

6 environment for isolating applications from applications executing in
7 association with other non-global zones, wherein each non-global zone uses
8 services of the virtual platform to access devices and services;
9 instructions for causing one or more processors to permit processes associated with
10 global zone to view and access objects in the global zone and view objects in
11 non-global zones;
12 instructions for causing one or more processors to permit processes of each non-
13 global zone to view and access objects only in the non-global zone; and
14 instructions for causing one or more processors to selectively permit upon authorized
15 request, a process of the global zone to access objects in a non-global zone;
16 and
17 wherein the virtual platform exists for a time period before or after the application
18 environment.

1 24. The computer readable medium of claim 23, further comprising:
2 instructions for causing one or more processors to permit a first process to obtain
3 access to objects within the global zone and a second process obtains access to
4 objects within the global zone and at least one non-global zone;
5 thereby enabling the global zone to provide at least one of a default environment and
6 a system administrative environment.

1 25. An apparatus, comprising:
2 a means for establishing a virtual platform comprising services for supporting non-
3 global zones; and

4 a means for establishing a first non-global zone for maintaining a first application
5 environment and a second non-global zone, for maintaining a second
6 application environment;
7 a means for isolating applications executing in association with the first application
8 environment from applications executing in association with the second
9 application environment; and
10 wherein the virtual platform exists for a time period before or after the application
11 environments.

1 26. An apparatus, comprising:
2 a means for establishing a virtual platform; and
3 a means for transitioning between a finite plurality of states upon occurrence of
4 configuring at least one non-global zone to form a configuration, installing the
5 configuration, establishing the virtual platform, establishing an application
6 environment and releasing resources of the virtual platform and the
7 application environment;
8 wherein the non-global zones each comprise an application environment for isolating
9 applications from applications executing in association with other non-global
10 zones in an operating system environment controlled by a single kernel
11 instance, and wherein the non-global zones use services of the virtual platform
12 to interface to applications within each other and to devices and services; and
13 wherein the virtual platform exists for a time period before or after the application
14 environment.

1 27. A system, comprising:
2 at least one processor; and
3 a memory connected with the processor, and operative to hold a plurality of program
4 instructions, including:
5 instructions for providing a single kernel instance operating system;
6 instructions for establishing and managing a virtual platform for providing
7 services and at least one non-global zone, including:
8 instructions for causing one or more processors to create a zone
9 configuration, thereby enabling transition from a first state to a
10 Configured state;
11 instructions for causing one or more processors to install the zone
12 configuration, thereby enabling transition from the Configured
13 state to an Installed state;
14 instructions for causing one or more processors to instantiate processes
15 for providing the plurality of services, thereby enabling
16 transition from the Installed state to a Ready state; and
17 instructions for causing one or more processors to start a process to
18 initialize user processes associated with a non-global zone,
19 thereby enabling transition from the Ready state to a Running
20 state;
21 wherein the virtual platform exists for a time period before or after application
22 environments associated with the non-global zones.